

PROTECTING YOURSELF DURING COLD WEATHER WORK

How do I interpret the weather for preparing to work in the cold?

Four factors contribute to cold stress: cold temperatures, high or cold wind, dampness and cold water by drawing heat from the body. A cold environment forces the body to work harder to maintain its core temperature of 98.6 °F. Cold stress can also be experienced from exposure to warmer temperatures in the 50's if it's coupled with rain and/or wind.

Effects from cold air and wind speed are combined to determine the “wind chill” factor (temperature in °F). The higher the wind speed and the lower the temperature in the work environment, the greater the danger. Please see the guidelines in Table 1 below to help you determine possible health effects from the wind chill temperature and how to dress to prevent them.

Note: The following guidelines were chosen since some of the workers using this chart may be over 60 years old, versus other guidance that only address adult workers in good health.

Table 1 - Wind Chill Hazards and How to Dress

Wind Chill °F	Exposure Risk	Health Concerns	What to Do
32 to 15.8	Low risk	<ul style="list-style-type: none"> • Slight increase in discomfort 	<ul style="list-style-type: none"> • Dress warmly • Stay dry
14 to -16.6	Moderate risk	<ul style="list-style-type: none"> • Uncomfortable • Risk of hypothermia and frostbite if outside for long periods without adequate protection. 	<ul style="list-style-type: none"> • Dress in layers of warm clothing, with an outer layer that is wind-resistant. • Wear a hat, mittens or insulated gloves, a scarf and insulated, waterproof footwear. • Stay dry and keep active

How do I prevent cold exposure and injuries?

The following prevention strategies in Table 2 can help minimize risks from accidents, exhaustion, dehydration, back injuries, or heart attacks when working in cold weather and shoveling snow.

Table 2 – Prevention Strategies to Prevent Cold Exposure and Injuries Due to Winter Conditions

Risk	Prevention Strategy
Slips, Trips, and Falls – slips and trips pose a fall hazard!	
Falls pose potential injuries (e.g., sprains, broken bones, or head injuries). Icy and windy conditions and poor visibility can increase the risk of a fall.	<ul style="list-style-type: none"> • Scan the area for icy surfaces and items under the snow and ice before proceeding to work. • Work when you can see adequately. • Wear slip resistant footwear.
Dehydration	
We do not experience thirst the same in cold weather as in hot. Thus, we may not be triggered to drink. We also lose moisture in winter from breathing dry air, exercising, and sweating.	<ul style="list-style-type: none"> • Drink plenty of water or warm, non-caffeinated drinks. • Cover exposed skin and wear waterproof, breathable footwear to stay dry as moisture will cause you to lose heat faster.

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Table 2 – Prevention Strategies to Prevent Cold Exposure and Injuries Due to Winter Conditions

Risk	Prevention Strategy
Cold Exposure	
<p>Prolonged exposure to cold can result in negative health conditions that range from mild discomfort to frostbite or hypothermia.</p> <p>Your need for thermal protection is very different when you are at rest than during physical exertion. Wear warm clothes while resting, and remove layers when performing heat-generating tasks to avoid sweating.</p>	<ul style="list-style-type: none"> • Cover your body (e.g., head, feet, hands). • Dress in layers of clothing, with an inner layer that is breathable or thermal underwear that allows sweat to escape from the skin surface. • Wear footwear that keeps you warm and dry. • Prepare to respond to health effects of cold stress by reviewing the Poster on <i>Cold Stress Injuries and First Aid</i>.
Muscular Strain and Heart Attack	
<p>Although snow is often perceived as fluffy, each shovel full can weigh around 10 pounds. Add in the weight of the shovel at 2-5 pounds. At a pace of one shovel per 10 seconds, there could be 90 pounds worth of snow being shoveled each minute!</p> <p>Shoveling can raise your heart rate and blood pressure. Reduce risks to your heart and muscles from strain to arms, neck or back, due to heavy loads, repetition, or bad postures by following these best practices.</p>	<ul style="list-style-type: none"> • Stretch and warm up before shoveling. • Work at a steady, even pace to prevent getting a chill if you are sweating. • Take periodic breaks in a warm area. • Be aware of your postures while shoveling. See the graphic below on <i>Proper Shoveling Techniques</i>. • Stop shoveling if you feel dizzy, nauseated, short of breath, or have pain in your back, arms or shoulders. Contact your supervisor and immediately seek medical care.

PROPER SHOVELING TECHNIQUES



Using a shovel, bend low at the knees, and keep your back straight.










Scoop and lift upward with your legs, keeping your back straight and your feet hip-width apart for balance. Keep the shovel close to your body.


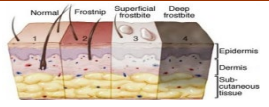
Point your feet in the direction you are unloading the snow and turn your whole body in that direction to unload the snow to avoid twisting your back!



If the snow is deeper than one foot, use your shovel to chop it down and scoop up small amounts at one time. If it is heavy, only partially fill the shovel.



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COLD STRESS INJURIES AND FIRST AID

 <h3>Hypothermia</h3> <p>Occurs when body heat is lost from being in a cold environment faster than it can be replaced. It often occurs after prolonged exposure to cold temperature.</p>		<p>Uncontrolled breathing</p> 	<p>Intense shivering</p> 	<p>Mental confusion</p> 	<p>Loss of coordination</p> 
<h4>Early Symptoms</h4> <ul style="list-style-type: none"> • Shivering • Fatigue • Loss of coordination • Confusion and disorientation 	<h4>Late Symptoms</h4> <ul style="list-style-type: none"> • No shivering • Blue skin • Dilated pupils • Slowed pulse and breathing • Loss of consciousness 	<p>Cold and blue skin</p> 	<p>Irregular heartbeat</p> 	<p>Weak pulse</p> 	<p>Enlarged pupils</p> 
<h4>First Aid</h4> <ul style="list-style-type: none"> • Request immediate medical assistance. Call 911 for medical care and rewarming instructions. • Move the person into a warm room or shelter and remove any wet clothing. • Warm the center of their body first (chest, neck, head, and groin) using a blanket. • If the person is conscious, warm beverages may help increase the body temperature. • Notify your supervisor when it is safe to do so. 					

 <h3>Frostbite</h3> <p>Occurs when layers of tissue freeze, most often affecting extremities (e.g., nose, ears, cheeks, fingers, toes).</p>		
<h4>Symptoms</h4> <ul style="list-style-type: none"> • Reduced blood flow to hands and feet • Numbness and/or aching • Tingling or stinging • Bluish or pale, waxy skin 	<h4>First Aid</h4> <ul style="list-style-type: none"> • Do – Follow instructions for <i>Hypothermia</i>. • Do - Call your supervisor. Go to urgent care or ER. • Do not - Rub the frostbitten area, or walk on frostbitten feet, as it could cause more damage. • Do not - Rewarm area unless instructed to. 	

 <h3>Trench Foot</h3> <p>A non-freezing injury of the feet resulting from prolonged exposure to wet and cold conditions. that can occur at temperatures as high as 60 °F if the feet are constantly wet for a long period of time.</p>		
<h4>Symptoms</h4> <ul style="list-style-type: none"> • Reddening of the skin • Numbness, tingling pain • Leg cramps • Swelling • Blisters or ulcers, bleeding under the skin • Gangrene (may turn dark purple, blue, or gray) 	<h4>First Aid</h4> <ul style="list-style-type: none"> • Remove shoes/boots and wet socks. • Gently clean, dry, and warm your feet up. • Elevate your feet above your heart and avoid walking on your feet. • Seek medical care for treatment. • Notify your supervisor when it is safe to do so. 	

 <h3>Chilblains</h3> <p>Ulcers formed by damaged small blood vessels in the skin, caused by the repeated exposure of skin to temperatures just above freezing to as high as 60 °F.</p>		
<h4>Symptoms</h4> <ul style="list-style-type: none"> • Inflammation, redness and itching • Possible blistering and ulceration in severe cases 	<h4>First Aid</h4> <ul style="list-style-type: none"> • Avoid scratching. • Slowly warm the skin. • Seek medical care. 	

Winter Safety Work Practices, and Cold Injuries and First Aid for Transfer Station Personnel

MANAGEMENT OF SNOW AND ICE TO PREVENT SLIPS, TRIPS, AND FALLS AT THE TRANSFER STATION

Preparation Before the Storm

- Determine schedule and responsibilities between the transfer station and DPW/highway department personnel for monitoring and mitigating conditions initially and then during the day when changing conditions such as temperature, precipitation, sun, and shade affect the condition of walking and driving surfaces.
- Obtain training on use of equipment and effective deicing methods.
- Inspect and fuel snow blowers and plows prior to use.
- Obtain shovels, signs, sand, and deicing supplies, and locate near point of use.

During the Storm

Monitor and Manage Walkways, Entrances and Stairways to Buildings and Material Pick-Up/Drop-Off Locations, and Parking Lots

Monitor and manage the following hazards throughout the day, even if the storm has ceased. This will help address the effects from changes in the sun, shade, precipitation, and temperature on surfaces with residual ice and snow.

- Keep areas shoveled, sanded/salted, and free of pooling water, snow and ice.
- Place signs such as “Wet Floor” and “Slippery Stair” near entrances and stairs, etc.
- Place signs in walkways and parking lots when conditions warrant it.
- Monitor parking lots to ensure people can safely enter and exit vehicles.
- Keep stair and handrails accessible.
- Close areas that cannot be mitigated.



After a Storm

- Continue to monitor and mitigate ice formation on walkways, parking lots, etc.
- Check for obstacles such as downed branches, windblown items, etc.
- Check for damage from plows, freeze and thaw impacts on hardscape, etc.



Sources

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3. OSHA, *Cold Stress Guide* and OSHA Quick Card - *Protecting Workers from Cold Stress*
4. NIOSH, *Preventing Cold-related Illness, Injury, and Death Among Workers*
5. NIOSH, *Fast Facts, Protecting Yourself from Cold Stress* (first aid information)
6. Cleveland Clinic, *Trench Foot*, <https://my.clevelandclinic.org/health/diseases/24392-trench-foot>
7. Apex, Occupational Health and Wellness, *Safe Snow Shoveling*, 11/17, <http://apexocc.com/news/safe-snow-shovelling/>
8. Princeton EHS Department, *Cold Stress Facts*
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